UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,919	08/18/2006	Shinji Yamamoto	2946-204	1069

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EXAMINER
CRAIG, DWIN M

ART UNIT	PAPER NUMBER
2123	

NOTIFICATION DATE	DELIVERY MODE
02/10/2011	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

PTO-PAT-Email@rfem.com

	Application No.	Applicant(s)
Office Action Summary	10/589,919	YAMAMOTO ET AL.
	Examiner	Art Unit	
	DWIN M. CRAIG	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on <u>15 December 2010</u>.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) <u>1-12</u> is/are pending in the application.

  4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) <u>1-12</u> is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

  a)☐ All b)☐ Some * c)☐ None of:

   1. ☐ Certified copies of the priority documents have been received.

   2. ☐ Certified copies of the priority documents have been received in Application No. _____.

   3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

A request for continued examination under 37 CFR 1.114, including the fee set forth in

37 CFR 1.17(e), was filed in this application after final rejection. Since this application is

eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e)

has been timely paid, the finality of the previous Office action has been withdrawn pursuant to

37 CFR 1.114. Applicant's submission filed on 12/15/2010 has been entered.

1.   Claims 1-12 have been presented for reconsideration based on Applicants' amended

claim language and arguments.

Response to Arguments

2.   Applicant's arguments presented in the 12/15/2010 responses have been fully considered;

the Examiner's response is as follows:

2.1   On page(s) 8 & 9 of the 12/15/2010 responses Applicants' argued that the newly

amended limitations of the different pieces of the virtual garment have been claimed "connected"

and that the Ziakovic reference fails to teach connected segments of garment pieces. More

specifically Applicants' argued;

Ziakovic teaches that the virtual garment is positioned on the human model in several

unconnected pieces that are later joined along the seam lines. See Ziakovic at Col. 2, Lns. 38-58.

Specifically, the Summary of the Invention of Ziakovic states that "[t]he invention provides a

method of viewing a garment made up of garment pieces on a virtual dummy..." See Ziakovic at

Col. 2, Lns. 38-39 (emphasis added). The Summary of the Invention goes on to state that:

In the invention, the pieces are firstly "painted" on the surface of the dummy so that they are touching, without taking account of the geometrical shape or of the physical behavior of the fabric. In other words, the pieces are pressed against the dummy. For this step, the pieces are deformed continuously, without tearing or intersection. They are then "sewn", by geometrical proximity.

The Examiner respectfully traverses Applicants' argument, after searching the text of the Ziakovic reference nowhere is the term unconnected to be found, in contrast the following portion of text was expressly disclosed, specifically Col. 1 lines 27-35;

"In a known method shown in FIG. 1, garment pieces 2, 4, 6 to be assembled together are placed approximately facing their final positions around a dummy 8. Then, the seam lines are <u>connected</u> together by pieces of "elastic" 10, 12, 14, 16, 18, 20, 22. The fabric is then simulated under conditions of "weightlessness". The pieces converge on one another and finally become stable edge-to-edge. It then remains merely to sew them together."

Thus Ziakovic does expressly teach connected portions of virtual fabric. Further, Ziakovic goes on to teach, Col. 12 lines 4-8 repeated here;

"Subdividing the portion of garment (or the corresponding data) to be processed may consist in isolating <u>connected zones</u> that are substantially compressed or stretched. Arbitrarily-connected subdivision is equally effective, but suffers from a slight loss of performance."

And. Col. 10 lines 14-11 describes "…sewn edges are merged…" which teaches again portions of the garment being connected.

Then on page 9 Applicants' further argued;

"Further, Baraff in no way addresses the initial positioning phase, but rather describes a second phase in which the positioned garments are deformed or relaxed such that a realistic appearance of the virtual garment is achieved. In this second phase, forces that would normally act on the garment (e.g., gravity, friction, and various tensions in the garment) are calculated and applied to the positioned garment. For this reason, Baraff fails to cure the above discussed *deficiency of Ziakovic."*

The Examiner respectfully traverses Applicants' arguments, Baraff is not required to provide teachings that are explicitly being disclosed in Ziakovic, see above thus there is no deficiency to be cured.

Applicants' argued on page(s) 10 & 11 that the use of Official Notice was no justified regarding the teachings of "having a stitch on a virtual or actual garment be arranged or re-arranged along the course or whale is well known in the garment art.

The Examiner respectfully traverses Applicants' arguments, there is no requirement that the cited reference Warsop teach simulation of fabric. A simulation in most cases requires the modeling of a "real-world" phenomena of entity, thus if a simulation is being performed of fabric, and real-world fabric is known to have a stitch on a garment be arranged in the course and whale direction, then it would be obvious, and useful to model this fact regarding knit garments in a simulation in order to model the manner in which knit garments are sewn in the real-world. It is for these reasons that the Examiner will maintain the use of Warsop in the application of Official Notice in rejecting claims 3 and 7.

<center>**Claim Rejections - 35 USC § 103**</center>

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

The factual inquiries set forth in Graham v. John Deere Co., 383 U.S. 1, 148 USPQ 459

(1966), that are applied for establishing a background for determining obviousness under 35

U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness
    or nonobviousness.

This application currently names joint inventors. In considering patentability of the

claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various

claims was commonly owned at the time any inventions covered therein were made absent any

evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

the inventor and invention dates of each claim that was not commonly owned at the time a later

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c)

and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3.   Claims 1, 2, 4, 5, 6, 8, 9, 10 and 12 are rejected under 35 U.S.C. 103(a) as being

unpatentable over U.S. Patent 6,968,297 to Ziakovic et al. in view of "Large Steps in Cloth

Simulation" hereafter referred to as Baraff et al.

3.1   As regards independent claims 1, 5 and 9 and using claim 1 as an example, Ziakovic

teaches, a method for simulating wearing of a knit garment on a human model, the knit garment

being a virtual knit garment and having a plurality of parts, (see Figures 1-9A and as regards a

teaching of a virtual dummy see Col. 2 lines 38-43, more specifically "…The invention provides

a method of viewing a garment made up of garment pieces on a virtual dummy…" a virtual

dummy is the same as a human model) the human model being a three-dimensional human

model and comprising a plurality of polygons (see Figure 16 and Col. 6 lines 44-48 more

specifically, "the surface resulting from the accumulation of convex polygons…"), the method

comprising the steps of: providing the human model with a plurality of axes (Figure 8 and the

descriptive text); matching each of the parts of the knit garment with any of the plurality of axes

(see Col. 4 lines 1-3, placing is functionally the same as matching, see also Col. 7 lines 6-12 not

the discussion regarding point-to-point relationship between the surface of the dummy and the

piece of fabric) and temporarily positioning the knit garment with respect to the human model;

and shrinking/expanding the temporarily positioned knit garment toward the axis matched with

each of the parts of the knit garment in a peripheral direction to obtain a natural size of each of

the parts, whereby the knit garment is worn on the human model so that each of the parts

appears outside the human model (see the discussion of deformation and fitting of the knit

garment to the model in Col. 9-14).

     As regards the newly amended limitation "expanding the connected parts of the knit

garment to form connected tubular parts of the knit garment,

        Ziakovic teaches Col. 1 lines 27-35;

"In a known method shown in FIG. 1, garment pieces 2, 4, 6 to be assembled together are placed approximately facing their final positions around a dummy 8. Then, the seam lines are connected together by pieces of "elastic" 10, 12, 14, 16, 18, 20, 22. The fabric is then simulated under conditions of "weightlessness". The pieces converge on one another and finally become stable edge-to-edge. It then remains merely to sew them together."

Thus Ziakovic does expressly teach connected portions of virtual fabric. Further, Ziakovic goes on to teach, Col. 12 lines 4-8 repeated here;

"Subdividing the portion of garment (or the corresponding data) to be processed may consist in isolating connected zones that are substantially compressed or stretched. Arbitrarily-connected subdivision is equally effective, but suffers from a slight loss of performance."

And. Col. 10 lines 14-11 describes "…sewn edges are merged…" which teaches again portions of the garment being connected.

However, Ziakovic does not expressly disclose, shrinking and expanding the knit garment toward matched axes so that a portion of the garment contacts the human model.

Baraff teaches, shrinking and expanding the knit garment toward matched axes so that a portion of the garment contacts the human model, see Figure 3 through Figure 7 as well as the discussion regards detecting collisions presented on pages 4 & 5 regarding stretch forces;

4.2   Stretch Forces

Recall that every cloth particle has a changing position x_i in world space, and a fixed plane coordinate (u_i, v_i). Even though our cloth is modeled as a discrete set of points, grouped into triangles, it will be convenient to pretend momentarily that we have a single continuous function $w(u, v)$ that maps from plane coordinates to world space. Stretch can be measured at any point in the cloth surface by examining the derivatives $w_u = \partial w/\partial u$ and $w_v = \partial w/\partial v$ at that point. The magnitude of w_u describes the stretch or compression in the u direction; the material is unstretched wherever $\|w_u\| = 1$. Stretch in the

v direction is measured by $\|w_v\|$. (Some previous continuum formulations have modeled stretch energy along an axis as essentially $(w_u^T w_u - 1)^2$, which is a quartic function of position [15, 16, 17, 4]. We find this to be needlessly stiff; worse, near the rest state, the force gradient—a quadratic function of position—is quite small, which partially negates the advantage implicit integration has in exploiting knowledge of the force gradient. A quadratic model for energy is, numerically, a better choice.)

4.4   Additional Forces

To the above forces we also add easily implemented forces such as gravity and air-drag (which is formulated on a per-triangle basis, and opposes velocities along the triangle's normal direction). When the simulation is fast enough to interact with, we add user-controlled "mouse" forces. These forces and their gradients are easily derived.

5 Constraints

In this section, we describe how constraints are imposed on indi-
vidual cloth particles. The constraints we discuss in this section are
either automatically determined by the user (such as geometric at-
tachment constraints on a particle) or are contact constraints (gener-
ated by the system) between a solid object and a particle. The tech-
niques we describe in this section could be used for multi-particle
constraints; however, constraints that share particle would need to
be merged. Thus, a set of four-particle constraints (such as ver-
tex/triangle or edge/edge contacts in the cloth) might merge to form
a single constraint on arbitrarily many particles, which would be ex-
pensive to maintain. Because of this, we handle cloth/cloth contacts
with strong springs (easily dealt with, given the simulator's underly-
ing implicit integration base) and "position alteration," a technique
described in section 6.

At any given step of the simulation, a cloth particle is either com-
pletely unconstrained (though subject to forces), or the particle may
be constrained in either one, two or three dimensions. Given the
differential nature of our formulation, it is the particle's accelera-
tion, or equivalently, the change in the particle's velocity, that is con-
strained. If the particle is constrained in all three dimensions, then
we are explicitly setting the particle's velocity (at the next step). If
the constraint is in two or one dimensions, we are constraining the
particle's velocity along either two or one mutually orthogonal axes.
Before describing our constraint method, we discuss several other
possible enforcement mechanisms and explain why we chose not to
use them.

Ziakovic and Baraff are analogous art because they both come from the same problem

solving area of simulating Knit Garments.

At the time of the invention, it would have been obvious, to an a person of ordinary skill

in the art to have used the teachings of tubular knit garments with a portion of the garment

having contact with a human model with the teachings of modeling a knit garment.

The motivation for doing so would have been, to have a faster simulation which uses a lower amount of processing resources, see page 1 of Baraff et al.

Therefore, it would have been obvious to combine the teachings of Baraff et al. with the teachings of Ziakovic in order to obtain the invention as specified in claims 1, 2, 4, 5, 6, 8, 9, 10 and 12.

3.2   As regards claims 2, 6 and 10 and using claim 2 as an example, Ziakovic discloses wherein: the human model comprises at least a torso and both arms, along with an axis of the torso, and axes of the right and left arms; the plurality of parts of the virtual knit garment comprises at least a body and sleeves, each of the parts is matched with any of the axes of the human model, and the temporal positioning is performed so that the axis matched with each of the parts passes through the inside of each of the parts; and both of the sleeves of the virtual garment are shrunk/expanded such that upper parts of the both sleeves contact with upper parts of the arms of the human model and spaces are provided at lower parts of the both sleeves with respect to the upper parts of the arms of the human model. (see the discussion of deformation and fitting of the knit garment to the model in Col. 9-14 and Figures 3-18 and the descriptive text).

3.3   As regards claims 4, 8 and 12 and using claim 4 as an example, , Ziakovic discloses wherein after wearing the knit garment, each of stitches of the knit garment is moved close to a mean position of surrounding stitches, whereby positions of the stitches of the knit garment are smoothed, and the smoothing is repeatedly performed. (see the discussion of deformation and fitting of the knit garment to the model in Col. 9-14 and Figures 3-18 and the descriptive text).

4.   Claims 3 and 7 are rejected under 35 U.S.C. 103(a) unpatentable over U.S. Patent

6,968,297 to Ziakovic et al. in view of Barraf et al.

4.1   As regards claims 1 and 2, from which claim 3 depends and claims 5 and 6 from which

claim 7 depends, see above.

4.2   OFFICIAL NOTICE

As regards claims 3 and 7, having a stitch on a virtual or actual garment be arranged or

re-arranged along the course or whale direction is well known in the garment art.

For example U.S. Patent 4,306,429 teaches stitch wales in bonded fabrics.

Claim interpretation, the disclosed teachings of Ziakovic teaches that a deformation

function is optimized, see Figure 14 item S342 and Col. 14 lines 55-60 more specifically, "The

garment can then be relaxed (step S34). Then comes the mechanical simulation step (S38) which

makes it possible, for a given fabric, to find the correct drape for it, and which makes it possible

to remove any remaining deformations. Is being interpreted to mean the same as the claimed

distortions as expressly claimed in Applicants' instant claims.

At the time of the invention, it would have been obvious, to an artisan of ordinary skill in

the art to have had a model of a tubular element in a virtual knit garment to be rearranged along

the course or wale direction.

Conclusion

5.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to DWIN M. CRAIG whose telephone number is (571)272-3710.

The examiner can normally be reached on 10:00 - 6:00 M-F.

        If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Paul L. Rodriguez can be reached on (571) 272-3753. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

        Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would

like assistance from a USPTO Customer Service Representative or access to the automated

information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

                                                Dwin M Craig
                                                Primary Examiner
                                                Art Unit 2123

/Dwin M Craig/
Primary Examiner, Art Unit 2123